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S6	6	(data with (densify or densification)) and join	US-PGPUB; USPAT	OR	OFF	2006/10/10 08:42
S7	314	(outer or outter) adj join	US-PGPUB; USPAT	OR	OFF	2006/10/10 08:43
S8	243	S7 and @ad<"20030822"	US-PGPUB; USPAT	OR	OFF	2006/10/10 08:44
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Abhinav Gupta, Sankar Subramanian, Srikanth Bellamkonda, Tolga Bozkaya, Nathan Folkert, Lei Sheng, Andrew Witkowski

 June 2004 **Proceedings of the 2004 ACM SIGMOD international conference on Management of data**

Publisher: ACM Press

 Full text available: [pdf\(227.07 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#)

Data in a relational data warehouse is usually sparse. That is, if no value exists for a given combination of dimension values, no row exists in the fact table. Densities of 0.1-2% are very common. However, users may want to view the data in a dense form, with rows for all combination of dimension values displayed even when no fact data exists for them. For example, if a product did not sell during a particular time period, users may still want to see the product for that time period with zero s ...

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Andrew Witkowski, Srikanth Bellamkonda, Tolga Bozkaya, Nathan Folkert, Abhinav Gupta, John Haydu, Lei Sheng, Sankar Subramanian

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Publisher: ACM Press

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Commercial relational database systems lack support for complex business modeling. ANSI SQL cannot treat relations as multidimensional arrays and define multiple, interrelated formulas over them, operations which are needed for business modeling. Relational OLAP (ROLAP) applications have to perform such tasks using joins, SQL Window Functions, complex CASE expressions, and the GROUP BY operator simulating the pivot operation. The designated place in SQL for calculations is the SELECT clause, whi ...

Keywords: Excel, OLAP, analytic computations, spreadsheet

3 [Online analytic processing \(OLAP\): Spreadsheets in RDBMS for OLAP](#)



Andrew Witkowski, Srikanth Bellamkonda, Tolga Bozkaya, Gregory Dorman, Nathan Folkert, Abhinav Gupta, Lei Shen, Sankar Subramanian

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Inderpal Singh Mumick, Dallan Quass, Barinderpal Singh Mumick

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Andrew Witkowski, Srikanth Bellamkonda, Tolga Bozkaya, Aman Naimat, Lei Sheng, Sankar Subramanian, Allison Waingold

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